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A BIBLIOMETRIC ANALYSIS OF ARTIFICIAL INTELLIGENCE IN PERFORMANCE EVALUATION: TRENDS AND GAPS IN CONSTRUCTION RESEARCH

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Abstract:

The integration of Artificial Intelligence (AI) into performance evaluation across various domains has emerged as a transformative research area, promising improved accuracy, objectivity, and efficiency in decision-making processes. However, despite growing interest, the literature remains fragmented, and a comprehensive understanding of global research trends is lacking. This study aims to bridge that gap by conducting a bibliometric analysis to map and evaluate the development, focus areas, and collaborative networks of research related to performance evaluation using AI. The study employs a robust methodology by retrieving bibliographic data from Scopus, refining and cleaning it using OpenRefine and Mendeley for consistency and accuracy, and analyzing it through VOSviewer to visualize keyword co-occurrences, country collaborations, and citation networks. A total of 801 relevant documents were identified and analyzed, spanning a diverse range of industries and applications. The findings reveal a sharp increase in publication trends since 2019, with India, China, and the United States emerging as the top contributing countries. “Machine learning,” “performance evaluation,” and “artificial intelligence” were the most frequently occurring keywords, indicating their centrality in the discourse. Highly cited papers focused on domains such as structural engineering, cybersecurity, and healthcare, reflecting the interdisciplinary application of AI in performance contexts. The

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visualization maps show strong international collaborations and evolving research clusters. This study concludes that AI-based performance evaluation is a growing field characterized by diverse applications and expanding global interest. However, there remains a need for more harmonized and cross-disciplinary research efforts. These insights provide researchers, practitioners, and policymakers with a clearer understanding of the research landscape and future directions in the application of AI for performance measurement.

Keywords:

Artificial Intelligence, Performance Evaluation, Bibliometric Analysis, Contractor Selection.

Introduction

Construction delays are a persistent challenge in the industry, often resulting in increased costs, extended timelines, and compromised project outcomes. These delays are commonly linked to contractor-related issues such as financial instability, inadequate site management, and poor planning and scheduling practices (Shaban et al., 2024; Toor & Ogunlana, 2008; Wuala & Rarasati, 2020). Additional contributing factors include material shortages, equipment failures, and labor constraints, all of which further hinder project progress(Gomarn & Pongpeng, 2018; Wuala & Rarasati, 2020). Addressing these causes is vital for improving the efficiency and success rates of construction projects. One of the most critical steps in this process is selecting an appropriate contractor. Contractor selection involves evaluating candidates based on criteria such as financial soundness, technical competence, and historical performance records (Araujo et al., 2016; Arslan, 2012; Khoso & Yusof, 2020). A well-informed and systematic selection approach can significantly enhance project outcomes by reducing delays and ensuring timely, cost-effective project delivery (Shukery et al., 2018; Tharanya et al., 2019). To support this, advanced methods, including multi-criteria decision-making and performance-based evaluation systems, have been introduced(Araujo et al., 2016; Shukery et al., 2018).

In recent years, Machine Learning (ML) has gained traction in the construction industry as a powerful tool for enhancing decision-making processes, particularly in contractor selection and performance evaluation. ML techniques are capable of processing large datasets to uncover hidden patterns and make predictive assessments, thereby enabling more proactive and data-driven management strategies (Koch, 2019; Mostofi et al., 2025; Shehab et al., 2022). Predictive models developed through ML can evaluate project performance based on key indicators such as cost, time, and quality, aiding in optimized resource allocation and risk mitigation (Koch, 2019; Shayboun et al., 2019). Traditionally, performance evaluation in construction has focused on cost, schedule adherence, and quality. However, modern frameworks have expanded to include dimensions such as safety, sustainability, and stakeholder satisfaction (Cha & Kim, 2011; Jalloul et al., 2022; Wang, 2025). The integration of ML into performance evaluation enables more accurate, objective, and comprehensive assessments by leveraging both quantitative and qualitative data (Visani et al., 2024; Zhang et al., 2023). This approach facilitates continuous improvement and supports smarter decision-making throughout the project lifecycle. Figure 1 shows the overview of AI in contractor selection trends.

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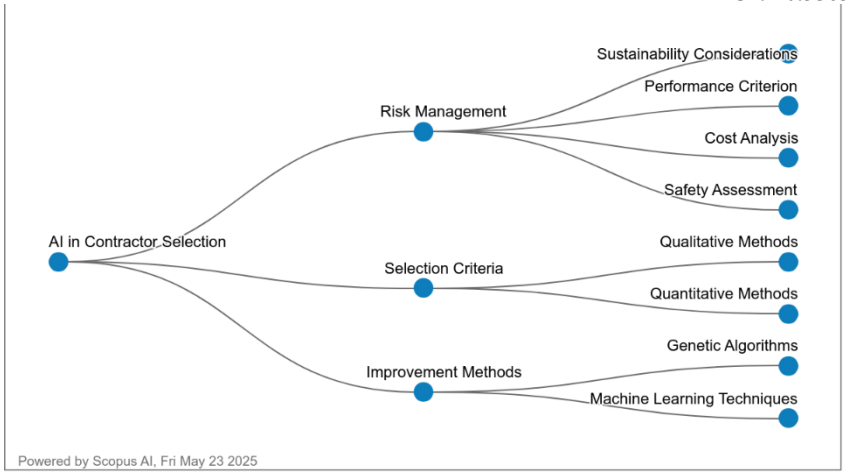

Figure 1: The Overview of the Contractor Selection Using AI Study

This paper aims to analyze the current research landscape on the application of AI, particularly ML, in performance evaluation, with a focus on identifying research gaps in the construction industry, specifically in the context of contractor selection. The following research questions guide the study: (1) What are the research trends in performance evaluation using AI according to the year of publication? (2) What are the most cited articles? (3) Which are the top ten countries based on the number of publications? (4) What are the most popular keywords associated with the study? and (5) What are the patterns of international co-authorship and collaboration?

Methodology

Bibliometrics involves gathering, organizing, and analyzing bibliographic data from scientific publications (Alves et al., 2021; Assyakur & Rosa, 2022; Verbeek et al., 2002). Beyond basic statistics, such as identifying publishing journals, publication years, and leading authors (Wu & Wu, 2017), bibliometrics includes more sophisticated techniques, including document co-citation analysis. Conducting a successful literature review requires a careful, iterative process to select suitable keywords, search the literature, and perform an in-depth analysis. This approach helps to compile a comprehensive bibliography and yields reliable results (Fahimnia et al., 2015). With this in mind, the study focused on high-impact publications, as they provide meaningful insights into the theoretical frameworks that shape the research field. To ensure data accuracy, Scopus served as the primary source for data collection (Al-Khoury et al., 2022; Di Stefano et al., 2010; Khiste & Paithankar, 2017). Additionally, to maintain quality, the study only considered articles published in peer-reviewed academic journals, deliberately excluding books and lecture notes (Gu et al., 2019). Using Elsevier's Scopus, known for its broad coverage, publications were collected from 1992 through 2025 for further analysis.

Data Search Strategy

A data search strategy was conducted using the Scopus database to identify relevant literature on the application of Artificial Intelligence (AI) in assessing contractor performance. The search began with a broad query using the terms "AI," OR "ML," which returned a total of 361,606 documents. To refine the results toward the research focus, additional keywords were introduced to capture studies related to performance assessment and contractor evaluation. The revised search string—(" Machine Learning (ML) ") AND ("performance assessment" OR "performance evaluation" OR "performance measurement" OR "contractor evaluation")—narrowed the results to 834 documents, as shown in Table 1. To further enhance the relevance

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of the dataset and exclude literature from unrelated medical and health fields, subject areas such as Neuroscience, Immunology and Microbiology, Psychology, Pharmacology, Toxicology and Pharmaceutics, Nursing, Dentistry, Veterinary, and Health Professions were excluded from the results, as shown in Table 2. These exclusions were made because the focus of this research is on exploring how AI is used to measure performance in the context of selection and decision-making across various sectors and industries. The objective is to identify the types of AI technologies, tools, and approaches used in such assessments, which are not commonly found in the medical or healthcare context. Moreover, the number of relevant articles within these medical domains was limited, making their inclusion less meaningful for the intended analysis. After applying these exclusions, the final dataset comprised 801 articles, representing a focused body of literature pertinent to the integration of AI in evaluating contractor performance and supporting decision-making processes.

Table 1: The Search String In Scopus

Scopus	TITLE (("AI" OR "ML") AND ("performance assessment" OR "performance evaluation" OR "performance measurement" OR "contractor evaluation")).

Table 2: The Selection Criterion In Searching

Criterion	Inclusion	Exclusion
Subject Area	Art and humanities, Computer Science Engineering Mathematics Decision Sciences Physics and Astronomy Energy Medicine Materials Science Environmental Science Social Sciences Earth and Planetary Sciences Chemical Engineering Business, Management and Accounting Chemistry Biochemistry, Genetics and Molecular Biology	Neuroscience, immunology and microbiology, Psychology, Pharmacology, toxicology and pharmaceutics, Nursing, dentistry, veterinary, and health professions

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Criterion	Inclusion	Exclusion
	Agricultural and Biological Sciences Multidisciplinary Economics, Econometrics and Finance	

Data Analysis

VOSviewer is a user-friendly bibliometric software developed by Nees Jan van Eck and Ludo Waltman at Leiden University, Netherlands (Van Eck & Waltman, 2010, 2017). Widely utilized for visualizing and analyzing scientific literature, the tool specializes in creating intuitive network visualizations, clustering related items, and generating density maps. Its versatility allows for the examination of co-authorship, co-citation, and keyword co-occurrence networks, providing researchers with a comprehensive understanding of research landscapes. The interactive interface, coupled with continuous updates, ensures efficient and dynamic exploration of large datasets. VOSviewer's ability to compute metrics, customize visualizations, and its compatibility with various bibliometric data sources make it a valuable resource for scholars seeking insights into complex research domains.

One of the standout features of VOSviewer is its capacity to transform intricate bibliometric datasets into visually interpretable maps and charts. With a focus on network visualization, the software excels in clustering related items, analyzing keyword co-occurrence patterns, and generating density maps. Researchers benefit from its user-friendly interface, enabling both novice and experienced users to explore research landscapes efficiently. VOSviewer's continuous development ensures it remains at the forefront of bibliometric analysis, providing valuable insights through metrics computation and customizable visualizations. Its adaptability to different types of bibliometric data, such as co-authorship and citation networks, positions VOSviewer as a versatile and indispensable tool for scholars seeking deeper understanding and meaningful insights within their research domains.

Datasets comprising information on the publication year, title, author name, journal, citation, and keywords in PlainText format were procured from the Scopus database, spanning the period from 1992 to 2025. These datasets were then analyzed using VOSviewer software version 1.6.19. Through the application of VOS clustering and mapping techniques, this software facilitated the examination and generation of maps. Offering an alternative to the Multidimensional Scaling (MDS) approach, VOSviewer focuses on situating items within low-dimensional spaces, ensuring that the proximity between any two items accurately reflects their relatedness and similarity (Van Eck & Waltman, 2010b). In this respect, VOSviewer shares a similarity with the MDS approach (Appio et al., 2014). Diverging from MDS, which primarily engages in the computation of similarity metrics like cosine and Jaccard indices, VOS utilizes a more fitting method for normalizing co-occurrence frequencies, such as the Association Strength (AS_{ij}), and it is calculated as (van Eck & Waltman, 2007):

$$AS_{ij} = \frac{C_{ij}}{w_i w_j},$$

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which is "proportional to the ratio between, on the one hand, the observed number of cooccurrences of i and j, and on the other hand, the expected number of co-occurrences of i and j under the assumption that co-occurrences of i and j are statistically independent" (Van Eck & Waltman, 2007).

Findings

What Are The Research Trends In Performance Evaluation Using AI According To The Year Of Publication?

The trend of publications on the topic of "Artificial Intelligence in Performance Measurement" has shown a significant upward trajectory, particularly over the last six years. Starting from minimal activity between 1992 and 2017, where annual publication counts ranged from one to four papers, the field gained noticeable traction beginning in 2018. The number of publications rose modestly from 18 in 2018 to 47 in 2019 and continued to increase steadily, reaching 74 papers by 2020. This steady growth during this period suggests a growing recognition of the relevance of AI in performance measurement across various sectors, likely driven by advancements in AI technology and its increasing accessibility.

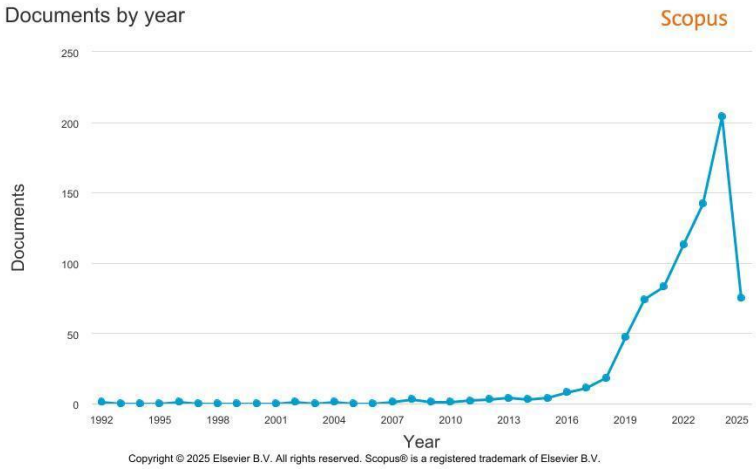

Figure 2: Trend of Research in Performance Evaluation Using AI by Years.

Table 3: Number of Publications by Year

YEAR	Number of publications	Percentage
2025	75	9.36%
2024	204	25.47%
2023	142	17.73%
2022	113	14.11%
2021	83	10.36%
2020	74	9.24%
2019	47	5.87%
2018	18	2.25%
2017	11	1.37%
2016	8	1.00%
2015	4	0.50%
2014	3	0.37%

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2013	4	0.50%
2012	3	0.37%
2011	2	0.25%
2010	1	0.12%
2009	1	0.12%
2008	3	0.37%
2007	1	0.12%
2004	1	0.12%
2002	1	0.12%
1996	1	0.12%
1992	1	0.12%

The most substantial growth occurred between 2021 and 2024. In 2021, there were 83 publications, rising to 113 in 2022 and then surging to 142 in 2023. The peak was reached in 2024 with 204 publications, accounting for the highest percentage (25.47%) of the total dataset. This explosive growth reflects a strong and widespread interest in leveraging AI for performance-related applications, possibly influenced by the broader digital transformation initiatives accelerated by the COVID-19 pandemic. Organizations across various industries appear to be actively exploring AI tools to enhance decision-making, monitor performance metrics, and improve operational efficiency, increasing academic output on the topic.

Although 2025 data is not yet complete, the current count of 75 publications (9.36%) indicates sustained interest in the area. If the trend continues at the current pace, 2025 may closely follow or surpass previous years in output. The recent surge underscores the maturity and importance of AI in performance measurement research. Moreover, the consistent growth in publications over time suggests that this is a developing field with expanding interdisciplinary engagement, encompassing sectors such as construction, manufacturing, business management, and beyond. As AI technologies continue to evolve, further research is expected to explore novel applications, tools, and evaluation frameworks, solidifying this area as a critical domain in performance analytics.

What Are The Most Cited Articles?

The analysis of the most cited articles on AI in performance measurement highlights a strong interdisciplinary engagement, with applications spanning from structural engineering to cybersecurity and agriculture. The most cited paper by Sun et al., (2021), published in the Journal of Building Engineering, received 408 citations and presents a state-of-the-art review of ML applications in building structural design and performance assessment. This indicates a significant interest in AI's ability to support complex, data-intensive engineering tasks. Its high citation count underscores the relevance of performance evaluation in the built environment, where AI contributes to optimizing design outcomes and improving construction efficiency.

The second most cited work by Schratz et al., (2019), with 333 citations in Ecological Modeling, focuses on the hyperparameter tuning and performance assessment of ML algorithms using spatial data. This article reflects the importance of fine-tuning algorithm performance in geospatial applications, a domain where AI supports environmental monitoring and resource management. The methodological focus on model tuning also shows a foundational aspect of performance measurement ensuring that ML models are not only applied but optimized for accurate and reliable results.

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Medical and cybersecurity applications also show a strong citation impact. Dwivedi, (2018) article on heart disease prediction using different ML techniques has 287 citations and demonstrates how performance evaluation is critical in healthcare-related AI tools, where predictive accuracy can significantly affect outcomes. Similarly, Belavagi & Muniyal, (2016) study, with 241 citations, and Belouch et al., (2018) work, with 172 citations, both evaluate supervised ML algorithms for intrusion detection. These studies show the reliance on AI not only for detection tasks but also for measuring and ensuring algorithmic performance in sensitive security environments, which are pivotal in both corporate and governmental infrastructures.

Environmental and agricultural sectors are also well-represented. Pham et al., (2020) evaluated ML models for forest fire prediction, and Ge et al., (2020) focused on land use classification, showing citations of 195 and 140, respectively. Both studies emphasize the importance of performance assessment in ecological risk management, where AI plays a growing role in predictive modeling. Meanwhile, Maya Gopal & Bhargavi, (2019) applied ML for crop yield prediction, receiving 131 citations, reflecting the agricultural sector's interest in data-driven performance insights to boost productivity and sustainability.

Overall, the high citation counts across these diverse articles affirm the growing scholarly and practical interest in performance evaluation as a key aspect of AI applications. These works illustrate that performance measurement is not confined to a single industry but is a unifying concern across sectors seeking to implement AI responsibly and effectively. The upward trend in citations and applications aligns with the global acceleration of digital technologies, where AI's value is closely tied to how well its outputs can be assessed, benchmarked, and improved.

Table 4: Most Cited Author

Authors	Title	Year	Source Title	Cited by
(Sun et al., 2021)	Machine learning applications for building structural design and performance assessment: State-of-the-art review	2021	Journal of Building Engineering	408
(Schratz et al., 2019)	Hyperparameter tuning and performance assessment of statistical and machine-learning algorithms using spatial data	2019	Ecological Modelling	333
(Dwivedi, 2018)	Performance evaluation of different machine learning techniques for prediction of heart disease	2018	Neural Computing and Applications	287
(Belavagi & Muniyal, 2016)	Performance Evaluation of Supervised Machine Learning Algorithms for Intrusion Detection	2016	Procedia Computer Science	241
(Pham et al., 2020)	Performance evaluation of machine learning methods for forest fire modeling and prediction	2020	Symmetry	195

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(Shutaywi & Kachouie, 2021)	Silhouette analysis for performance evaluation in machine learning with applications to clustering	2021	Entropy	181
(Belouch et al., 2018))	Performance evaluation of intrusion detection based on machine learning using apache spark	2018	Procedia Computer Science	172
(Ge et al., 2020)	Land use/cover classification in an arid desert-oasis mosaic landscape of China using remotely sensed imagery: Performance assessment of four machine learning algorithms	2020	Global Ecology and Conservation	140
(Maya Gopal & Bhargavi, 2019)	Cyber Threat Detection Using Machine Learning Techniques: A Performance Evaluation Perspective	2020	1st Annual International Conference on Cyber Warfare and Security, ICCWS 2020 - Proceedings	139
(Maya Gopal & Bhargavi, 2019)	Performance Evaluation of Best Feature Subsets for Crop Yield Prediction Using Machine Learning Algorithms	2019	Applied Artificial Intelligence	131

The Top 10 Countries Based On The Top Cited

The bibliometric analysis reveals that India leads significantly in terms of publication output, with 263 documents. This dominant contribution can be attributed to India's increasing emphasis on digital transformation across various sectors, including education, agriculture, healthcare, and smart infrastructure. The country's rapidly growing tech ecosystem, combined with government initiatives like Digital India and the availability of skilled data scientists and engineers, likely fuels research output in this area. Indian institutions and researchers appear to be actively engaged in exploring the practical application of AI in measuring and improving performance in both the public and private sectors.

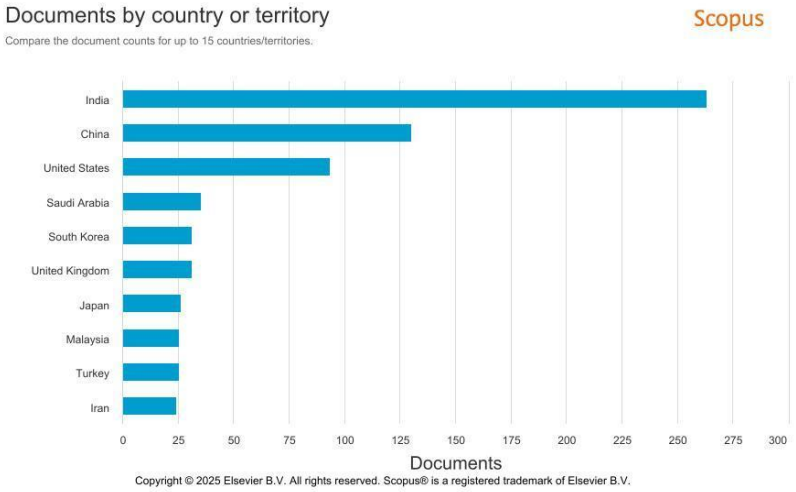

Figure 3: Documents Published According to Country.

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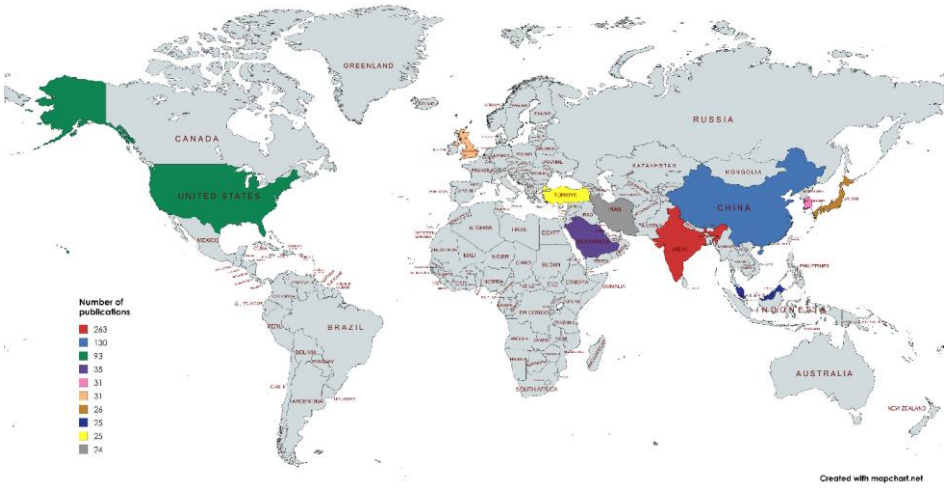

Figure 4: Number of Publications According to Country.

China ranks second with 130 publications, reflecting its strategic focus on AI as a cornerstone of national development. The country has invested heavily in AI research, with support from both government and industry. In the context of performance measurement, Chinese researchers are exploring the use of AI for smart city management, industrial automation, and educational assessment, among other areas. China's contribution underscores a well-funded, policy-driven research agenda that encourages the integration of AI into performance metrics, particularly in large-scale systems and urban development initiatives. The United States, with 93 publications, also shows strong engagement, consistent with its longstanding leadership in AI innovation and development. However, compared to India and China, the U.S. output is slightly lower in this specific area, potentially reflecting a more diversified research landscape in which AI is applied across many subfields. Nonetheless, American research often sets methodological standards and contributes high-impact work, particularly in performance evaluation frameworks, ML model benchmarking, and ethical considerations in AI deployment.

Several countries from the Middle East and Asia, such as Saudi Arabia (35), South Korea (31), and Iran (24), show emerging interest in this research area. Saudi Arabia's active research presence is likely influenced by its Vision 2030 initiative, which promotes the use of AI and digital performance tracking in public sector transformation and smart city planning. Similarly, South Korea and Iran have national strategies promoting AI integration, and their contributions reflect increasing regional attention toward performance optimization using intelligent systems. These countries are likely to focus on AI's utility in infrastructure, healthcare, and administrative reforms.

European and Southeast Asian countries, including the United Kingdom (31), Japan (26), Malaysia (25), and Turkey (25), also make significant contributions. The UK's participation reflects its academic excellence and government funding in AI research, while Japan's contributions are rooted in its industrial focus and robotics innovation. Malaysia's output is notable among Southeast Asian nations, indicating a growing research community and alignment with national digital economy plans. Turkey's research activity may be driven by interest in AI's role in education, manufacturing, and smart governance. Overall, the global

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distribution highlights AI in performance measurement as a truly international research domain with varied regional priorities and applications.

What Are The Popular Keywords Related To The Study?

The bibliometric analysis of keywords using VOSviewer reveals that "ML" dominates the research landscape in the field of AI for performance measurement, with the highest number of occurrences (424) and total link strength (674). This suggests that ML is not only the most frequently mentioned technique but also the most connected term across publications, reflecting its central role in driving performance evaluation models. The prominence of "AI" (122 occurrences, 197 link strength) and "performance evaluation" (103 occurrences, 174 link strength) further reinforces the thematic core of this field, indicating that researchers are extensively exploring the interplay between AI tools and performance metrics across different applications.

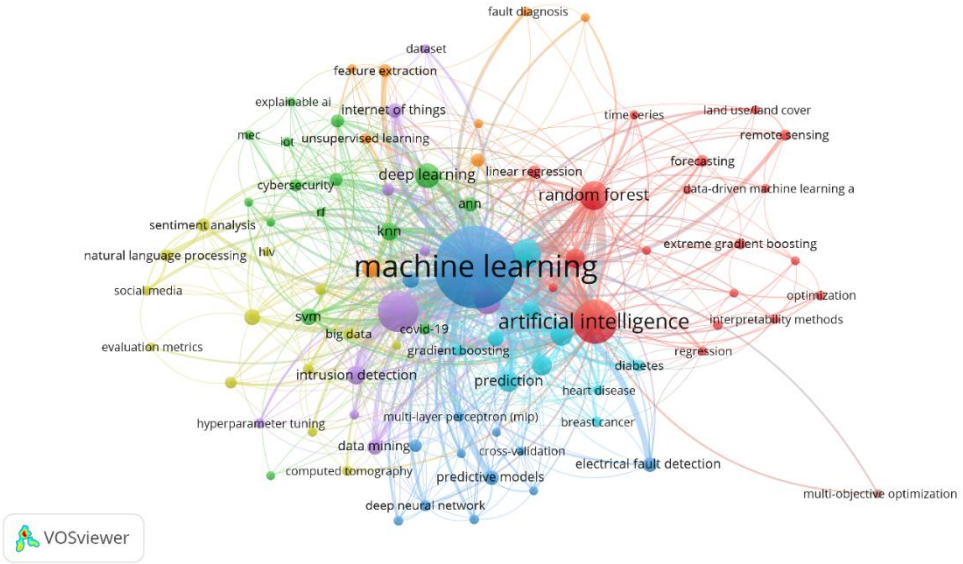

Figure 5: Network Visualization Map of Keywords' Co-Occurrence

Table 5: Keywords Occurrences

keyword	occurrences	total link strength
machine learning	424	674
artificial intelligence	122	197
performance evaluation	103	174
random forest	52	162
support vector machine	52	162
classification	46	129
decision tree	31	126
naïve bayes (nb)	25	87
k-nearest neighbor	20	73
knn	20	69
deep learning	38	67
logistic regression	16	67
neural networks	24	65

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Among specific algorithms, "random forest" and "support vector machine" both appear 52 times with equal link strengths of 162, highlighting their popularity and relevance in performance-related AI studies. These techniques are commonly known for their accuracy and robustness in predictive modeling, which aligns with the goals of performance evaluation. Other algorithms, such as "classification" (46 occurrences), "decision tree" (31), and "naïve Bayes" (25) also show significant presence and connectivity. The consistent inclusion of these terms reflects a strong focus on supervised learning methods, particularly classification tasks, where model performance is a critical measure. Their relatively high link strengths indicate active co-occurrence with other keywords, showcasing their integration within broader research contexts. Lower-frequency keywords like "deep learning" (38 occurrences), "logistic regression" (16), "neural networks" (24), "k-nearest neighbor" (20), and "knn" (20) still maintain meaningful link strengths indicating that even less frequently discussed methods contribute substantively to the field's development. Although deep learning and neural networks are not as dominant in this dataset, their presence suggests a growing interest in more complex, layered models for performance evaluation, possibly in areas involving large datasets or image/text data. Overall, the keyword analysis highlights a strong methodological orientation in the literature, with a clear emphasis on selecting, applying, and comparing ML models for evaluating performance across diverse sectors.

What Are Co-Occurrence, Co-Citation, And Countries' Collaboration?

The bibliometric analysis of country-wise contributions reveals that India leads significantly in the field of AI in performance measurement, with 263 publications and the highest citation count of 2,886, indicating both productivity and research impact. China and the United States followed closely with 130 and 93 documents, respectively. Both countries show strong citation records (1,644 and 1,503, respectively), along with notable total link strengths, highlighting their central roles in international collaboration networks. Saudi Arabia and the United Kingdom contribute moderate volumes of publications (35 and 31, respectively). Yet, maintain competitive citation counts, suggesting a high impact per publication, which is indicative of research quality and relevance in this area.

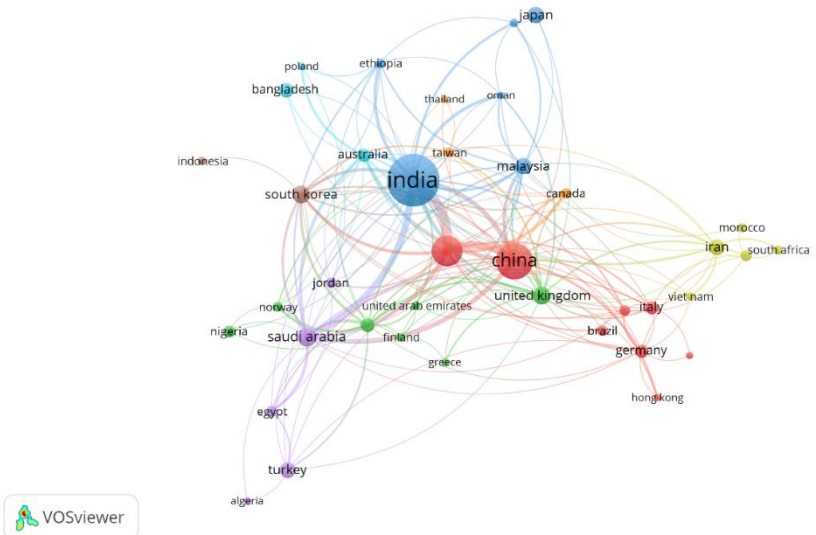

Figure 6: Analysis of Country-Wise Contributions

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Several other countries, including Malaysia, Pakistan, Australia, South Korea, and Iran, also show active participation, with publication numbers ranging from 18 to 31 documents. Malaysia and Australia have relatively high citations compared to their document counts, which may reflect a strong research focus or niche expertise. Iran, despite a moderate number of publications (24), stands out with 748 citations, showing that its work resonates well within the academic community. Countries such as Canada, Germany, and Spain contribute fewer documents but exhibit high citation-to-publication ratios, emphasizing the significant influence of their research in the AI performance measurement domain. The presence of emerging economies like Ethiopia, Oman, Iraq, and Bangladesh, though with lower output, signals a growing global interest in the application of AI for performance evaluation across diverse sectors. Meanwhile, countries like Vietnam and Morocco have fewer documents, and their high citation numbers suggest concentrated, impactful studies. Conversely, nations such as Japan, Turkey, and Nigeria, although more productive, show lower citation impacts, indicating potential for growth in research quality or international visibility. Overall, the landscape reflects a dynamic and expanding research field, with both established and emerging countries contributing to the development of AI methodologies in performance measurement across sectors.

Conclusion

The objective of this bibliometric analysis was to examine the research landscape of AI in performance evaluation, with a specific focus on its trends, contributors, and thematic development. The study set out to answer questions related to publication growth, highly cited works, influential countries, keyword prominence, and patterns of international collaboration. Through data sourced from the Scopus database and refined using tools such as OpenRefine, Mendeley, and VOSviewer, a final dataset of 801 documents was analyzed. This systematic approach allowed for a comprehensive mapping of scholarly activity in the field from 1992 to 2025.

The findings of the analysis highlight a sharp rise in research interest since 2018, with India, China, and the United States emerging as the most active contributors. "ML," "performance evaluation," and "AI" were identified as dominant keywords, underlining the field's technological and evaluative orientation. The analysis of citations revealed that highly influential studies come from a diverse set of application areas, including construction, healthcare, cybersecurity, and agriculture, indicating the multidisciplinary nature of AI-based performance measurement. The visualizations generated through VOSviewer further revealed strong collaboration networks and keyword clustering, reflecting the interconnectedness of global research efforts.

This study adds value by providing a structured overview of the scholarly contributions and research directions in AI-driven performance evaluation, thus providing a foundation for future exploration and integration. Meanwhile, the data indicate a broad interest in AI applications across many fields. However, a noticeable lack of focused research remains within the construction industry, particularly in the use of AI for contractor selection based on performance criteria. This gap suggests an opportunity for future studies to address the sector-specific needs of construction management by developing AI models tailored for evaluating and selecting contractors more effectively. The practical implications suggest that AI tools are becoming increasingly essential in supporting performance analysis across sectors. Nonetheless, certain limitations, such as database exclusivity and language restrictions on publication, may have excluded relevant literature. Future research could expand to include

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other databases or adopt qualitative approaches to deepen thematic understanding. In conclusion, this analysis demonstrates the usefulness of bibliometric techniques in uncovering intellectual patterns and informing strategic developments in the growing intersection of AI and performance measurement.

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